



Natural Gas and Electricity Deregulation in the United States

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What is the FERC?

- **U.S. Government Agency**
 - Independent Executive Branch Agency
 - Decisions subject to review by U.S. Courts
- **5 Voting Commissioners**
 - Appointed by the President
 - Confirmed by the Senate
 - Five Year Terms
- **1250 Employees**
 - Engineers, Technical Specialists
 - Lawyers
 - Economists



Role of the FERC

- **Regulation of Natural Gas Transportation (101 Pipelines Subject to FERC Jurisdiction)**
 - rates and services of interstate pipelines
 - licensing of pipeline construction
- **Regulation of Electric Industry**
 - Wholesale Sales of Electricity
 - Interstate Electric Transmission (174 jurisdictional transmission owning electric utilities and independent system operators)
- **Hydroelectric Licensing (over 1700 hydroelectric projects)**
- **Regulation of Interstate Oil Pipelines**



Two Levels of Energy Regulation

FEDERAL

- FERC
- Wholesale Transactions
- Rates, terms and conditions of interstate transmission service

STATE

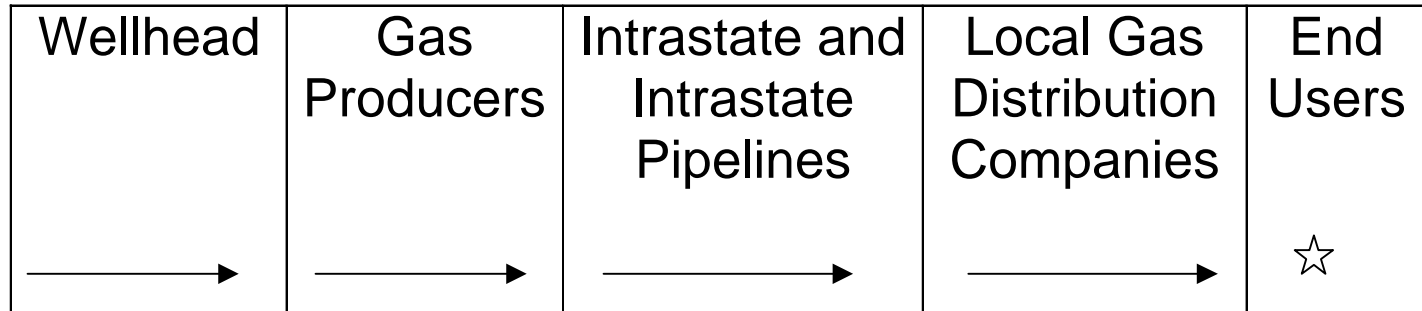
- 50 State Regulatory Commissions
- Retail Transactions
- Rates, terms and conditions of local distribution



Participants in the U.S. Natural Gas Industry

- **Thousands of Natural Gas Producers**
- **101 Interstate Pipeline Companies**
- **Intrastate Pipeline Companies**
- **Local Distribution Companies**
- **Natural Gas Marketers**

NATURAL GAS INDUSTRY PRE-1985 BUNDLED PRODUCT



- **Natural gas producers sold gas to interstate pipelines**
- **Pipelines sold bundled product (natural gas and transportation capacity) to LDCs**



Order No. 636 -- 1992

- **Mandated unbundling of supply and transportation services by all interstate pipelines**
- **Required non-discriminatory open access transportation**
- **Required separation of pipeline transportation and sales functions (marketing affiliates)**
- **Gas supply transition costs recovered through access charges**



Marketing Affiliate Standards of Conduct Order No. 497 -- 1988

- **Physical separation of pipeline and marketing affiliate staff**
- **No preferences to marketing affiliates**
- **No sharing of information (received from non-affiliated customers) between pipeline and marketing affiliate**
- **Requires disclosure of transportation-related information to all customers contemporaneously**



Success of Natural Gas Restructuring

- **Robust competition for natural gas supply**
- **Increases in natural gas use -- the 30 Tcf economy**
- **Financially healthy pipelines**
- **Availability of innovative and non-discriminatory pipeline services**
- **Reliable and reasonably priced natural gas and pipeline services**
- **Development of scores of market hubs and pooling points**
- **Commoditization of natural gas**
- **Integration of North American natural gas market**
- **Electronic communication via Internet**



Effect of Restructuring on Natural Gas Prices

- **Wellhead price declined over 40 percent between 1992 and 2000**
- **Recent drilling declines resulted in a short-term run-up in wellhead prices**
- **Drilling activity has increased substantially, which will increase natural gas deliverability**
- **Supply and demand will equilibrate in the near future**



Emerging Issues

- **Impact of Electric Restructuring on Natural Gas**
- **Convergence of Gas and Electric Markets**
- **New Gas-fired Electric Generation**
- **Supply and Demand Imbalance**
- **30 Tcf Market by 2010**



U.S. Electricity Policy

- **Commitment varies by jurisdiction**
- **FERC is committed to competitive wholesale markets**
- **About half of the 50 states committed to competitive retail markets**



Reasons for Transition to Markets

- **High cost excess generating capacity**
- **Technological change**
 - **Scale economies in generation declined**
 - **Transmission over greater distances**



FERC Policies in the 1990s

- **Market based pricing for generation service**
- **Open access to the transmission grid (Order No. 888)**
 - **Open access tariff**
 - **Unbundling: transmission service separated from generation service**
 - **System information and service requests in Internet bulletin board**



Recent Changes in U.S. Electricity Industry

- **Grid users multiply**
- **Growing number of non-utility generators**
- **Utility divestiture of generation**
- **Mergers**
- **Grid regionalization**
- **Some states adopt retail choice**
- **Well structured regional wholesale markets, such as PJM**



Elements of Well Functioning Electricity Markets -- Overview

- **Rational grid management through regional transmission organizations**
- **Unconcentrated market structure**
- **Hedging and forward contracting**
- **Demand responsiveness**
- **Accurate scheduling**
- **Efficient congestion management**
- **Market monitoring**
- **New generation and transmission**



Transmission Grid Impediments to Good Markets

- **Discrimination**
- **Reliability**
- **Splintered grid management**
- **Balkanized markets**
- **Insufficient transmission investment**



Elements of Well Functioning Markets: Regional Transmission Organizations (RTOs) -- Order No. 2000 - December 1999

- **Independence -- from market participants**
- **Large geographic size**
- **Effective operational control**
- **Single transmission rate**



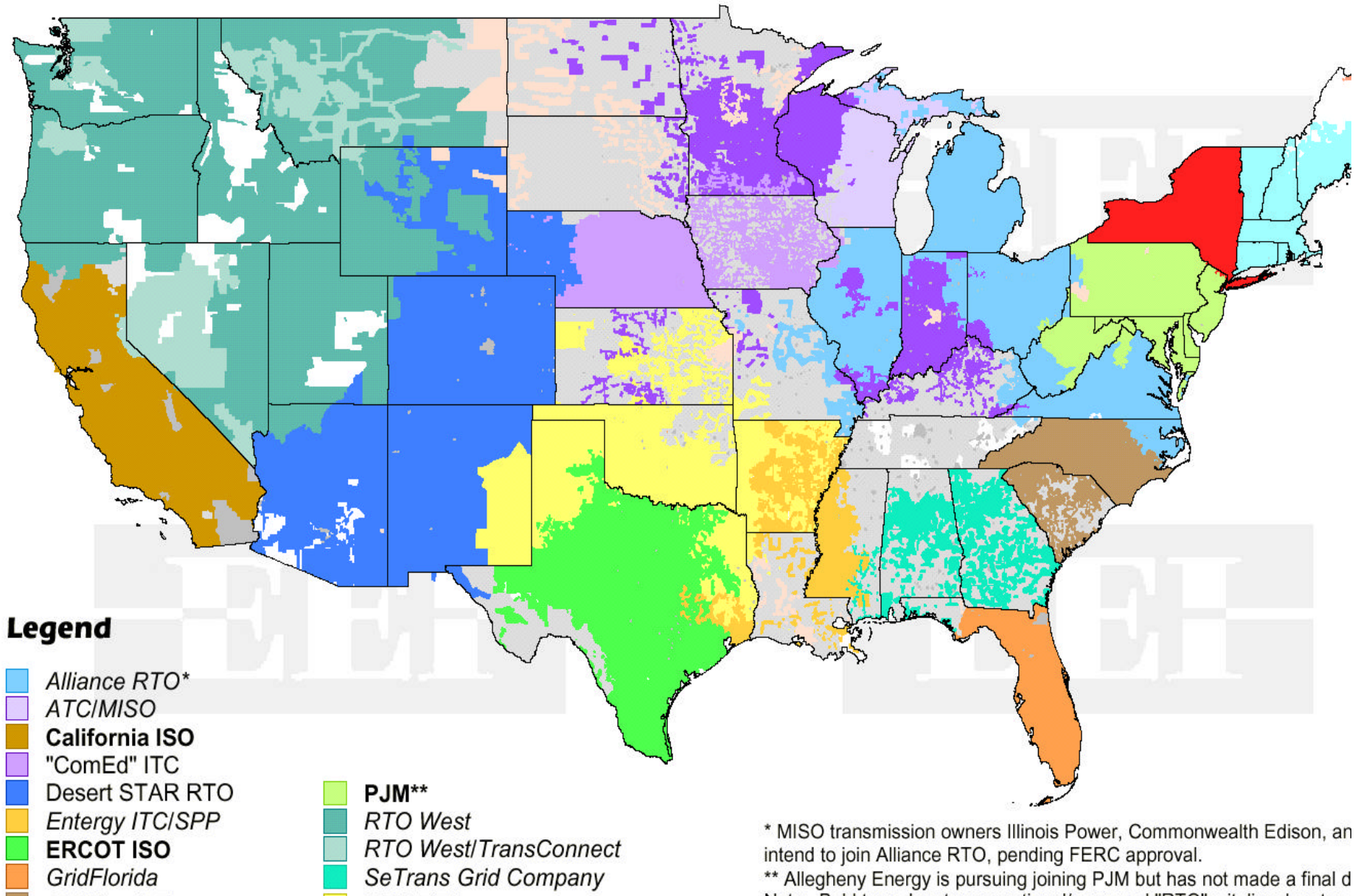
Elements of Well Functioning Markets: RTOs (Continued)

- **Other standards**
 - **Planning authority**
 - **Regional bulletin board for grid information**
 - **Single transmission tariff**
 - **Calculate available capacity**
 - **Market-based congestion management system**



Regional Transmission Organizations

Utility Participation as of November 2000





Elements of Well Functioning Markets (Continued)

- **Unconcentrated market structure**
 - to prevent raising prices by withholding supply
- **Hedging**
 - avoid over-reliance on volatile spot markets
 - forward contracts and other hedging instruments
- **Demand responsiveness**
 - helps to prevent price run-ups
 - allow demand reduction bids (“negawatts”)



Elements of Well Functioning Markets (Continued)

- **Accurate scheduling**
 - limits need for real time power procurement
 - reserve requirement
 - single day-ahead market
- **Congestion management system**
 - locational marginal cost pricing
 - reduces redispatch costs
 - sends accurate price signals for expansion needs



Elements of Well Functioning Markets (Continued)

- **Market monitoring**
- **New generation and transmission resources**
 - **eliminate unnecessary obstacles to new facilities**
 - **uniform, streamlined interconnection procedures**



Conclusion

- **Gas restructuring successful**
- **Electric restructuring**
 - a work in progress
 - RTO formation necessary
 - elements of well functioning markets necessary
- **FERC committed to competitive markets**